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No. 61

RESEARCH AID

ESTIMATED FLOORSPACE OF SEMENOVKA AIRFRAME PLANT NO. 116

CIA/RR RA-33
15 May 1958

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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(ORR Project 33.1732)

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FOREWORD

This research aid, one of a series evaluating current floorspace of Soviet airframe plants of the Ministry of the Aviation Industry (Ministerstvo Aviatsionnoy Promyshlennosti -- MAP), is based on German sketches of the airframe plant. Supplementary intelligence data also have been used in an attempt to ascertain the dimensions, composition, and functions of the individual plant buildings. An effort has been made to determine the areas of the plant which are multistory, and the latest information on new construction has been included. This research aid will be revised and reissued periodically to include new intelligence information as available.

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ESTIMATED FLOORSPACE OF SEMENOVKA AIRFRAME PLANT NO. 116*

Summary

Semenovka Airframe Plant No. 116 in the USSR contains a floorspace of 810,000 square feet (sq ft).** Of this total, the plant has a final assembly area of approximately 250,000 sq ft. The administration area of the plant is believed to comprise about 74,000 sq ft, or about 9 percent of the total floorspace.*** Analysis of prisoner-of-war reports indicates a minimum of 130,000 sq ft of multistory area, representing approximately 17 percent of the estimated total floorspace. Airframe Plant No. 116 is believed to contain a minimum of 67,000 sq ft of warehouse area.**** No known basement areas exist within the plant. The plant site is estimated to contain approximately 6.3 million sq ft and to have a total roof area of about 670,000 sq ft, resulting in a building densityt of 11 percent.

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* Based in part on the German intelligence estimate of the plant. 1/ (For serially numbered source references, see Appendix D.) See Figure 1, following p. 2. The estimates and conclusions contained in this research aid represent the best judgment of ORR as of 1 April 1958.

** All figures dealing with square footage which are used in the text of this research aid are rounded to two significant digits.

*** All percentages are computed with actual figures.

**** The term warehouse is applied to those buildings or areas within the plant which have the primary functions of receiving materials from external sources and of holding these materials in bulk quantities for subsequent distribution to the processing points in the plant.

The term storage areas is applied to those buildings or areas, usually parts of buildings which have primary functions other than storage, in which materials are stored or maintained for the direct support of production or service activities. These areas normally are located adjacent to the activities which they support, and they receive their stores from plant warehouses.

† The term building density represents the proportion of the total roof area of an airframe plant to the total plant site expressed as a percentage.

1. Location.

Semenovka Airframe Plant No. 116 (44°09' N - 133°15' E) is located in the USSR on the south edge of Semenovka, approximately 1 nautical mile east of the Daubikhe River. 2/ The plant airfield, Semenovka Airfield, is immediately adjacent to the plant on the southeast.

2. History.

Semenovka Airframe Plant No. 116 reportedly was built between 1936 and 1939. Unlike many Soviet airframe plants, Airframe Plant No. 116 appears to have been planned originally as an aircraft plant.

In 1940, Semenovka Airframe Plant No. 116 reportedly was used as a repair depot for the Soviet Far Eastern Air Force. The plant, believed to have produced the UT-2 trainer during World War II, 3/ probably has produced trainer aircraft and civilian consumer goods since the war. This plant is not known to have engaged in production of jet aircraft.

3. Description.

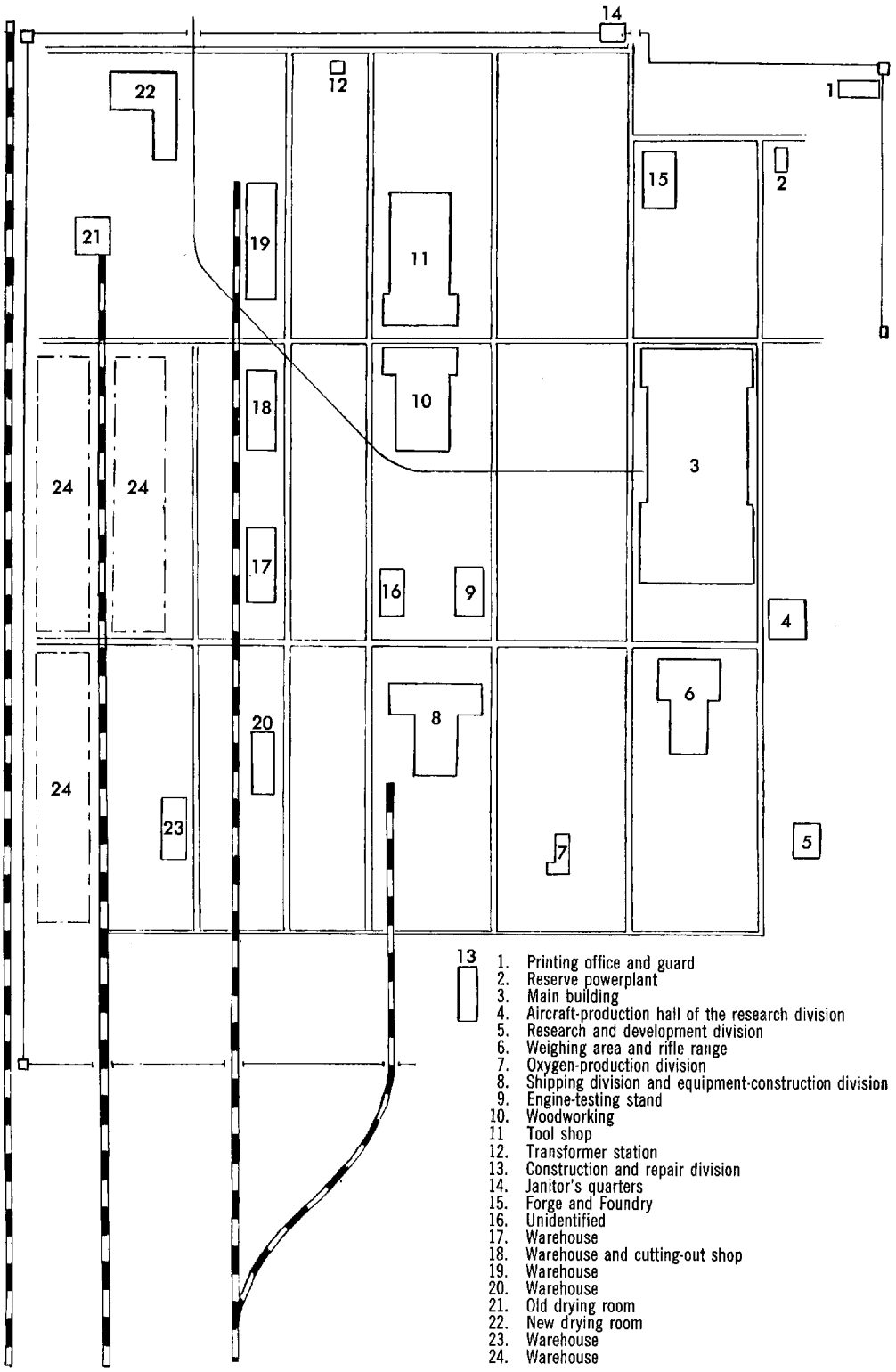
From analysis of German drawings of Semenovka Airframe Plant No. 116 and Japanese prisoner-of-war reports, it is estimated that the plant covers an area of roughly 6.3 million sq ft, of which approximately 670,000 sq ft represents the roof area. The building density of the plant is 11 percent. The plant site is rectangular in shape (see Figure 2*), approximately 2,700 by 2,300 feet (ft). Prisoner-of-war interrogations reveal that within the plant there are about 130,000 sq ft of multistory floorspace, representing about 17 percent of the estimated total floorspace of about 810,000 sq ft.**

The plant warehouses, located on rail spurs within the plant site, appear to be adequate for a plant of this size. The 13 probable warehouses contain an estimated minimum total of 67,000 sq ft, or 8 percent of the total floorspace. One large administration building, reportedly under construction in 1948 and presumably completed, contains the only known administration areas within the plant.

Large vacant areas for expansion of the plant are found within the plant site and are bounded by existing roads. Expansion of the plant could be planned in an orderly fashion because the existing buildings are laid out in rectangular street patterns. The plant site is located on level terrain. No evidence concerning contemplated significant expansion of production facilities is available.

* Following p. 2.
** See Appendix A.

USSR: GERMAN LAYOUT OF SEMENOVKA AIRFRAME PLANT NO. 116



1. Printing office and guard
2. Reserve powerplant
3. Main building
4. Aircraft-production hall of the research division
5. Research and development division
6. Weighing area and rifle range
7. Oxygen-production division
8. Shipping division and equipment-construction division
9. Engine-testing stand
10. Woodworking
11. Tool shop
12. Transformer station
13. Construction and repair division
14. Janitor's quarters
15. Forge and Foundry
16. Unidentified
17. Warehouse
18. Warehouse and cutting-out shop
19. Warehouse
20. Warehouse
21. Old drying room
22. New drying room
23. Warehouse
24. Warehouse

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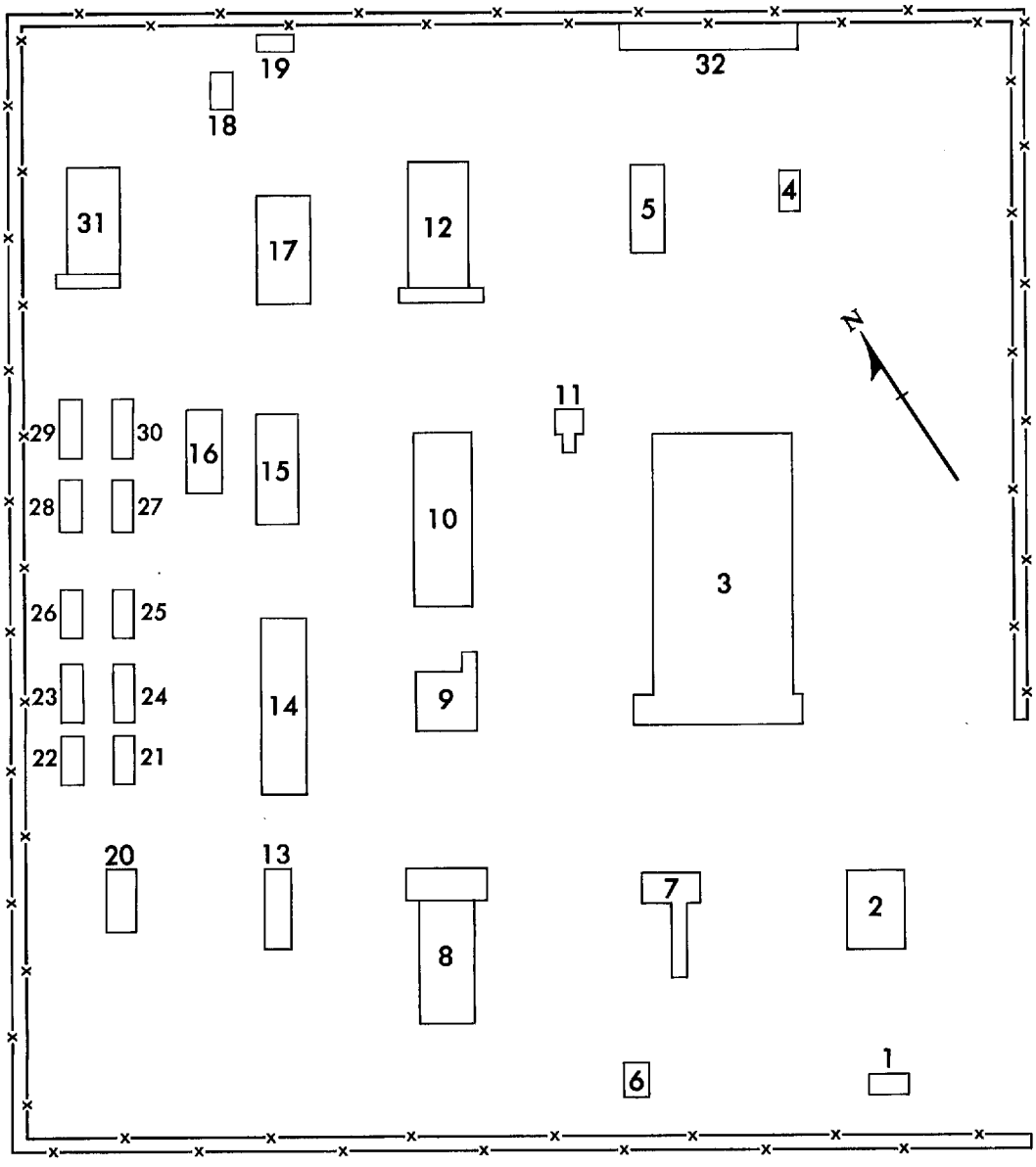
Figure 2

USSR: ESTIMATED LAYOUT OF SEMENOVKA AIRFRAME PLANT NO. 116



1. Unknown
2. Hangar
3. Shop
4. Shop
5. Shop
6. Shop
7. Shop
8. Shop
9. Unknown
10. Shop
11. Unknown
12. Shop
13. Warehouse
14. Shop
15. Shop
16. Shop
17. Shop
18. Warehouse
19. Warehouse
20. Warehouse
21. Warehouse
22. Warehouse
23. Warehouse
24. Warehouse
25. Warehouse
26. Warehouse
27. Warehouse
28. Warehouse
29. Warehouse
30. Warehouse
31. Shop
32. Administration

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The major buildings reportedly are constructed of concrete or bricks, steel frame, and sheet metal. Most of the major buildings have a monitor roof design, and hipped, gable, and flat roofs are found on the less important structures. (See Figure 3.*)

Whereas most of the aircraft produced at Semenovka Airframe Plant No. 116 are believed to be shipped by rail, the Semenovka Airfield may be used as a test and flyaway field for the airframe plant.

4. Final Assembly.

Prisoner-of-war reports indicate that the final assembly area of Semenovka Airframe Plant No. 116 is contained in 1 shop type of building 735 ft long by 335 ft wide. (See Figure 4.*) This building, Building No. 3,** is constructed of masonry and steel and contains approximately 250,00 sq ft, or 30 percent of the total factory floorspace.*** There are no reported basement or multistory areas within the building. The building has a flat roof topped by monitors. 4/ It is reported that the interior fabrication shop is divided into subassembly areas with shop equipment and forming jigs for production of airframes. 5/ Final assembly and engine installation probably take place in the larger bay at the extreme south end of the building.

5. Postwar Construction.

Only one relatively large building reportedly has been constructed since World War II at Semenovka Airframe Plant No. 116. 6/ This building, Building No. 32, probably contains approximately 74,000 sq ft of floorspace.*** Located at the entrance of the plant, the building is of masonry construction. The building probably houses most of the administration area of the plant and contains approximately 9 percent of the total floorspace. Because there is no indication of the date of construction, the building is not treated as new construction.

* Following p. 4.
** Building numbers refer to the designations in Figure 2, following p. 2.
*** See Appendix A.

TYPES OF ROOFS

Figure 3

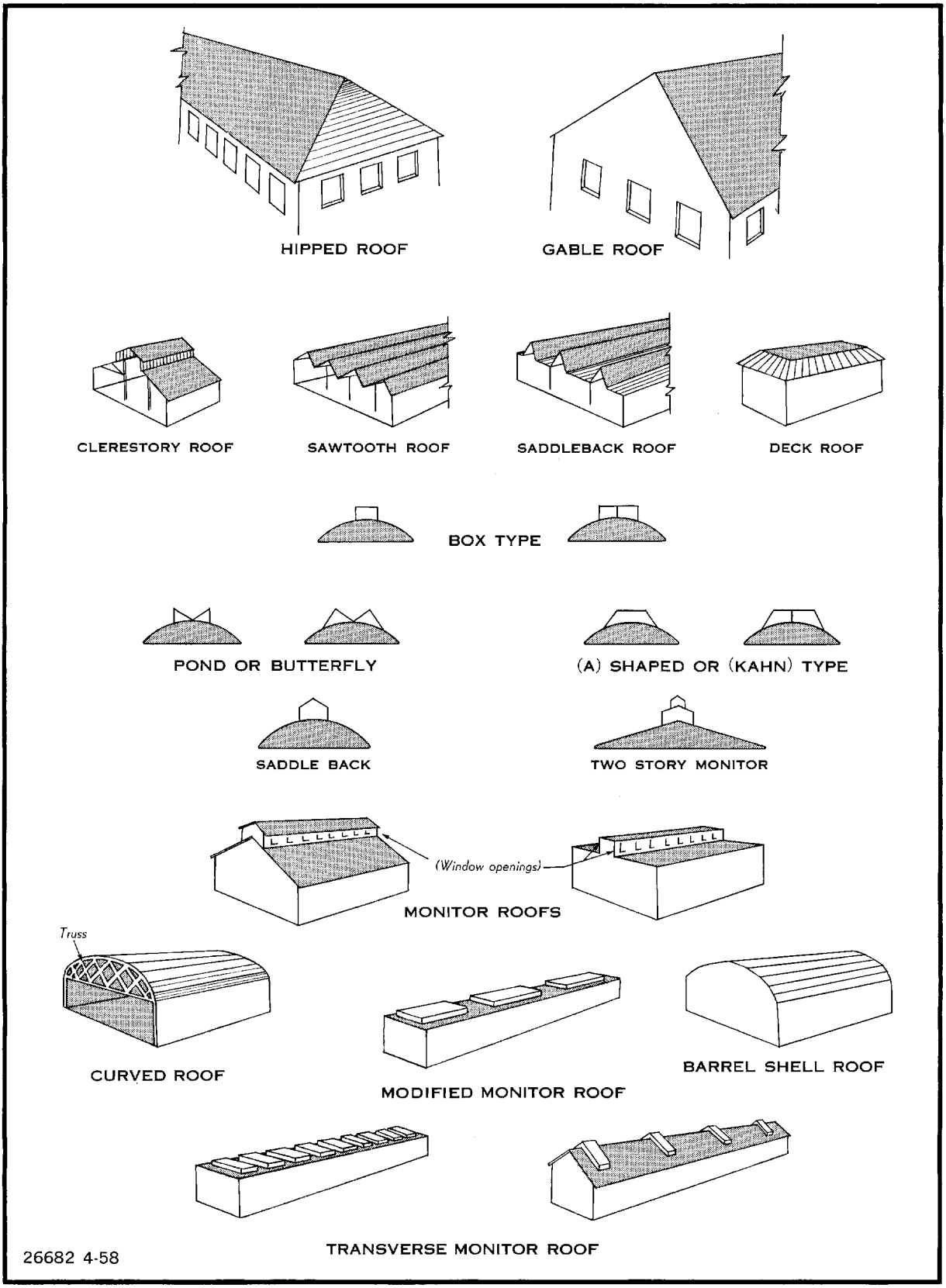
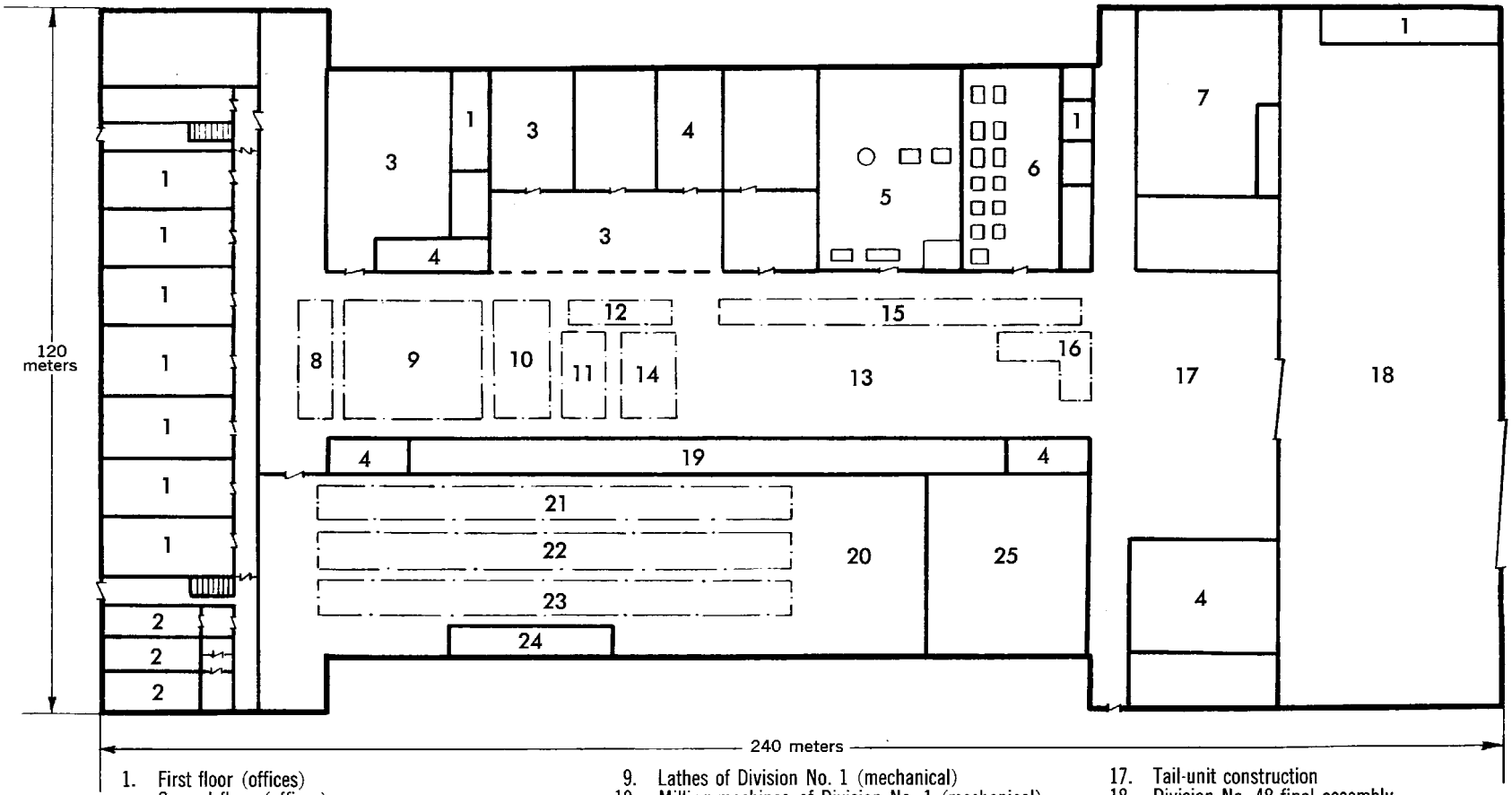


Figure 4

USSR: GERMAN LAYOUT OF THE MAIN ASSEMBLY BUILDING OF SEMENOVKA AIRFRAME PLANT NO. 116



1. First floor (offices)
   Second floor (offices)
2. Secret (or private) division
3. Machine shop
4. Warehouse
5. Thermal division
6. Galvanizing division
7. Painting shop of Division No. 1 (mechanical)
8. Automatic-machinery of Division No. 1 (mechanical)
9. Lathes of Division No. 1 (mechanical)
10. Milling machines of Division No. 1 (mechanical)
11. Drilling machines of Division No. 1 (mechanical)
12. Grinding machines of Division No. 1 (mechanical)
13. Division No. 5 duralumin bleaching
14. Shears of Division No. 5
15. Presses of Division No. 5
16. Chasing hammer of Division No. 5
17. Tail-unit construction
18. Division No. 48 final assembly
19. Offices
20. Division No. 11 initial assembly
21. Surface construction of Division No. 11
22. Fuselage construction of Division No.11
23. Inside-wing construction of Division No. 11
24. Tool distribution room of Division No. 11
25. Aileron-assembly of Division No. 11

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APPENDIX A

COMPOSITION OF THE FLOORSPACE OF SEMENOVKA AIRFRAME PLANT NO. 116 a/*

* Footnotes for this appendix follow on p. 7.

APPENDIX B

METHODOLOGY

On the basis of available intelligence, an effort was made to determine the function of the major buildings in Semenovka Airframe Plant No. 116, to identify multistory plant areas, and to account for new plant construction. All known buildings within the plant complex, except sheds with areas less than 1,500 sq ft, are listed in Appendix A.*

A combination of German World War II intelligence reports and sketches and prisoner-of-war interrogation reports was used to determine the roof area and the physical layout of the plant. Although this category of information often is considered unreliable, plausible data from this source have been utilized to determine dimensions, function of buildings, and multistory areas. Whenever the functions of buildings or the number of stories were unknown, the best judgment of the analyst was used to provide an estimate.

* P. 5, above.

APPENDIX C

GAPS IN INTELLIGENCE

The accuracy of the estimates of the floorspace of Semenovka Airframe Plant No. 116 is impaired greatly because of a scarcity of information. The lack of both vertical and oblique photography precludes accurate judgment of dimensions, heights, and functions of buildings within the plant area.

The lack of photography of the plant has necessitated reliance primarily on German sketches and German functional analysis reports of the plant. Helpful information was obtained from interrogations of Japanese prisoner-of-war returnees. Unfortunately these returnees generally were restricted to the warehouse areas of the plant. Other than in respect to the size of buildings, their observations are vague and incomplete.

Information pertaining to multistory areas within the plant is virtually nonexistent. Because estimates of floorspace in multistory areas greatly affect the estimate of total floorspace, acquisition of this information is of prime importance. Oblique ground photography aids in the determination of multistory areas. Because this photography, like vertical photographic coverage of Semenovka Airframe Plant No. 116, is lacking, only a rough estimate of height can be made. As in source 8/, the total floorspace of Airframe Plant No. 116 may be in error by as much as 25 percent.

APPENDIX D

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

Source of Information	Information
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this research aid. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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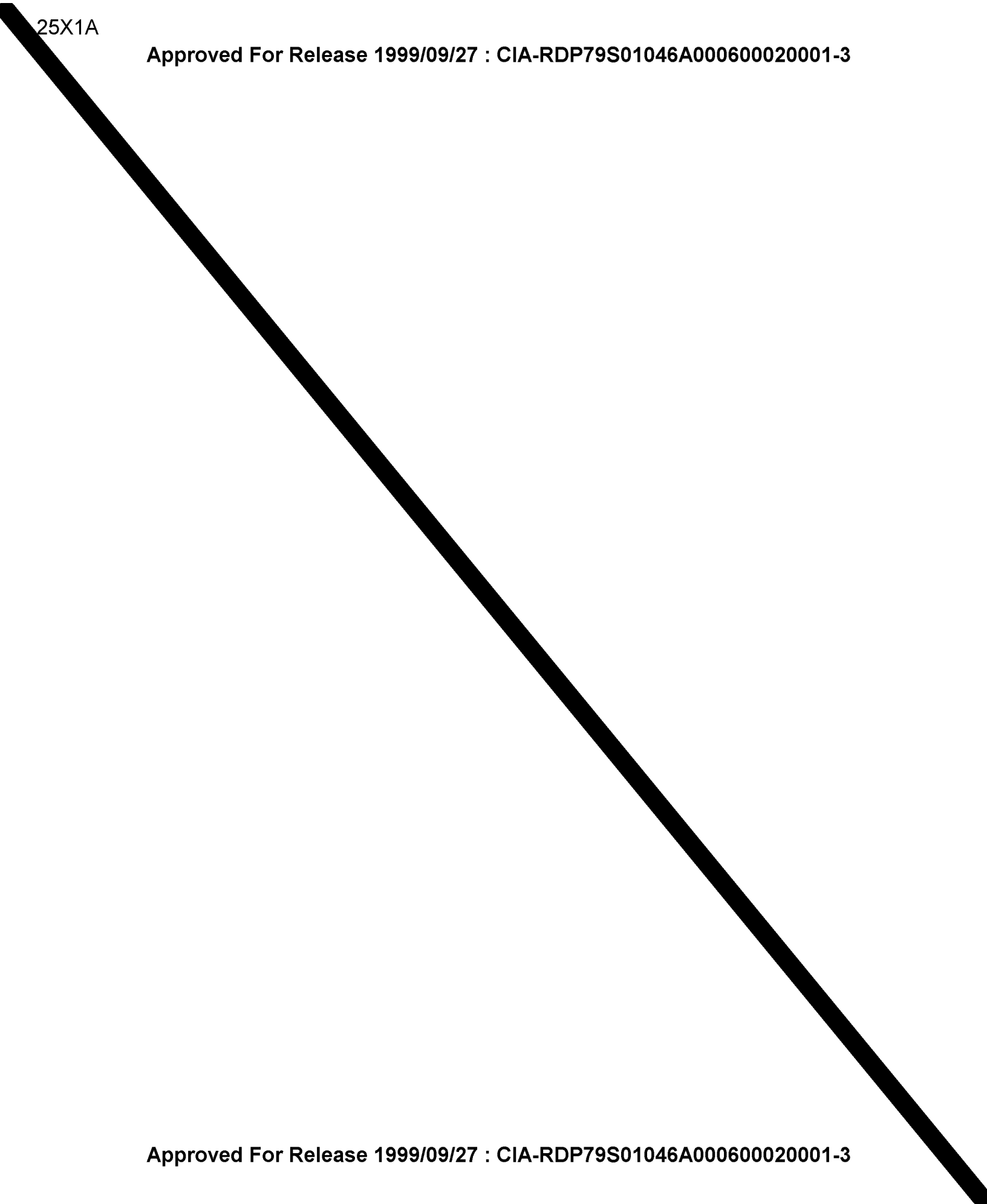

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